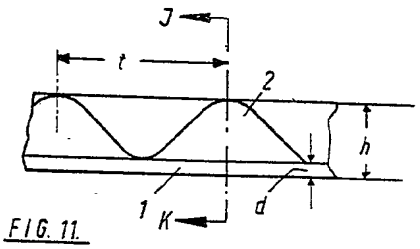

FIG. 11.

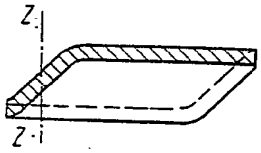

FIG. 12.

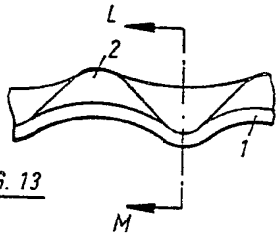

FIG. 13

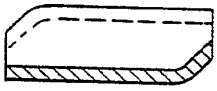

FIG. 14.

FIG. 15

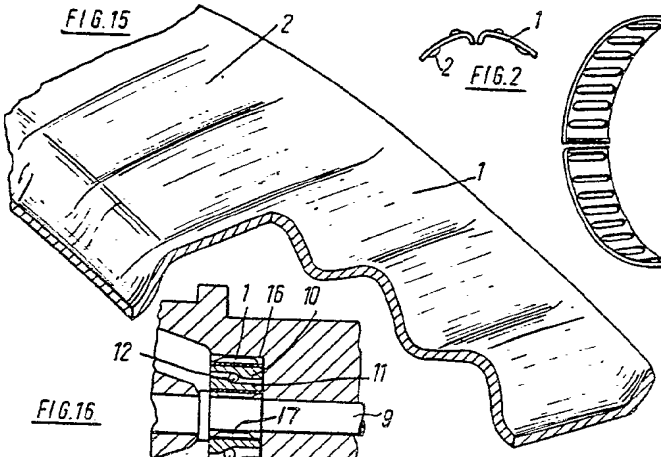

FIG.2

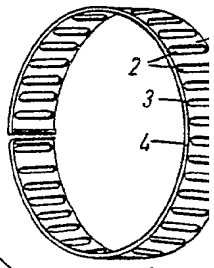

FIG. 1.

FIG.16

866678
2 SHEETS

PROVISIONAL SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale

Sheets 1 & 2

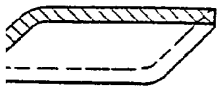

FIG. 12.

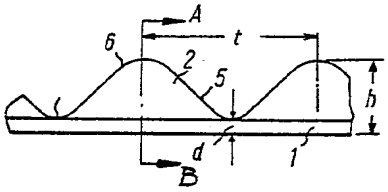

FIG.3.

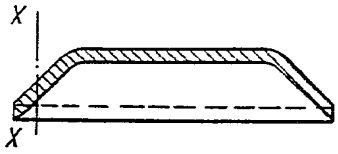

FIG. 4.

G. 14.

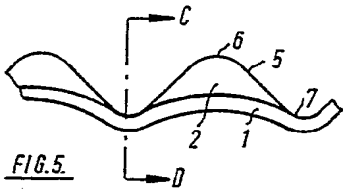

FIG.5.

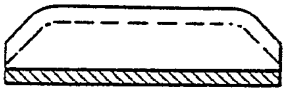

FIG.6.

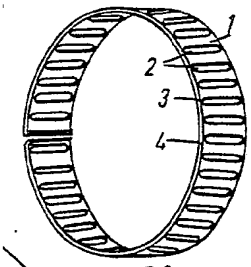

FIG. 1.

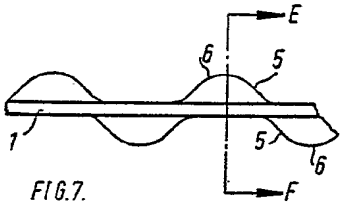

FIG.7.

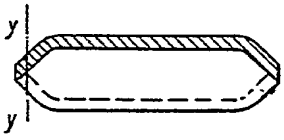

FIG.8.

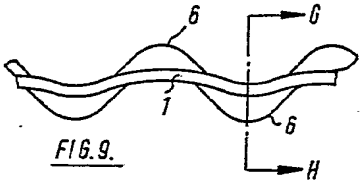

FIG.9.

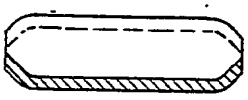

FIG.10.

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2 SHEETS

PROVISIONAL SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale

Sheets 1 & 2

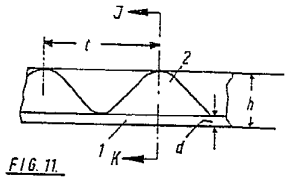

FIG. 11.

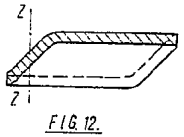

FIG. 12.

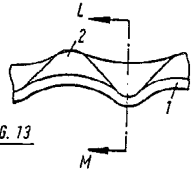

FIG. 13

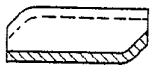

FIG. 14

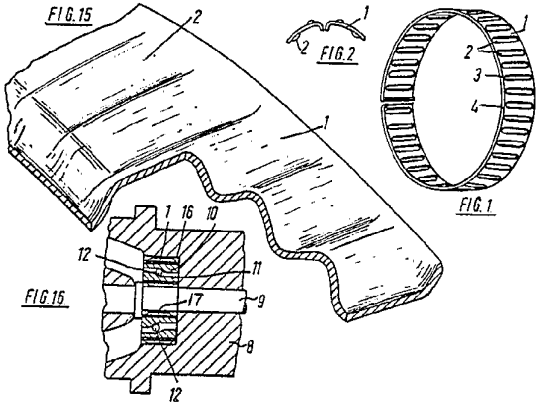

FIG. 15

FIG. 16

FIG. 2

FIG. 1

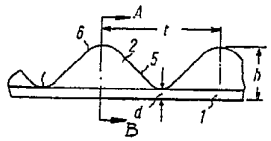

FIG. 3.

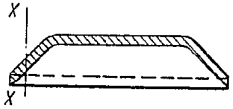

FIG. 4.

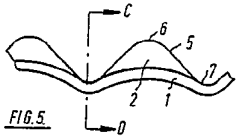

FIG. 5.

FIG. 6.

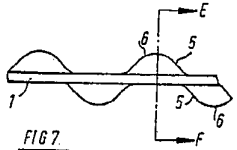

FIG. 7.

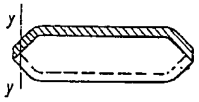

FIG. 8.

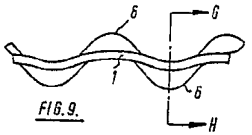

FIG. 9.

FIG. 10.

PATENT SPECIFICATION

DRAWINGS ATTACHED

Inventor: WALTER WESTON

866,678

Date of filing Complete Specification Dec. 23, 1958.

Application Date Jan. 1, 1958. *No. 106/58.*

(Patent of Addition to No. 703,563 dated May 4, 1951).

Complete Specification Published April 26, 1961.

Index at acceptance:—Classes 12(1) A7(B2:X); and 80(2), S2A4C.

International Classification:—F06c. F06d.

COMPLETE SPECIFICATION

Improvements in or relating to Seatings for Machine Parts

We, DEUTSCHE STAR KUGELHALTER G.m.b.H., a Body corporate, organized and existing under the laws of the Federal Republic of Germany, of Schweinfurt, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to improvements in and modifications of seating means for seating two members upon or within each other claimed in Patent No. 703,563.

Patent No. 703,563 claims a seating means for seating two members upon or within each other, comprising a ribbon or springy sheet metal curved along its longitudinal axis to form a sleeve with the ends of the ribbon juxtaposed and having smooth marginal portions extending round the sleeve and a corrugated portion between the smooth marginal portions of the opposite edges of the sleeve, the sequence of the undulations of the corrugated portion being longitudinal in relation to the ribbon.

It is a main object of the present invention to provide and improvement in or modification of the seating aforesaid which will provide a corrugated ribbon between the two members to be seated which will facilitate assembly of the two members without substantial risk of damage by permanent distortion to the ribbon along the edges thereof when the same is fitted between the two seating members.

According to the present invention an improvement in or modification of the seating means for two seating members upon or within each other as claimed in Patent No. 703,563 is characterised in that the undulations of the corrugated portion of the sleeve are spaced transverse indentations with curved ends which, at least at one edge of the ribbon, extend up to said edge which is tangential to or truncates said curved ends.

In one particular construction both edges of the ribbon are tangential to or truncate the curved ends of the indentations.

In one preferred example both edges of the ribbon truncate the curve indentation ends and the indentations are preferably of the same length and width and the edges truncate all the indentations in the same degree.

In another preferred construction at least one ribbon edge is tangential to the centre portions of the curved ends of the indentations. In a further preferred construction the end portions of the corrugations have their ends curved transversely of the general plane of the ribbon towards the edge of the ribbon and terminating in the ribbon edges.

The indentations may be made all from one face of the ribbon, or are made some from the inside and some from the outside face of the ribbon preferably alternately from each face of the ribbon.

In order that the invention may be more clearly understood some constructions in accordance therewith will now be described, by way of example, with reference to the drawings accompanying the provisional specification, in which:—

Figure 1 is a perspective view of a sleeve shaped ribbon according to the invention;

Figure 2 is a fragmental view of the abutting ends of a sleeve shaped ribbon;

Figure 3 is a fragmentary longitudinal elevation of a springy ribbon;

Figure 4 is a cross section on the line A—B of Figure 3, Figures 3 and 4 being drawn to a larger scale than Figures 1 and 2;

Figures 5 and 6 are similar views to Figures 3 and 4, Figure 6 being on the line C—D of Figure 5,

[*Price 3s. 6d.*]

Figures 7 and 8 are similar views of another embodiment similar to Figures 3 and 4, Figure 8 being on the line E—F of Figure 7;

Figures 9 and 10 are similar view of a still further embodiment, Figure 10 being on the line G—H of Figure 9;

Figures 11 and 12 are similar views of a further embodiment, Figure 12 being on the line J—K of Figure 11;

Figures 13 and 14 are similar views of another construction, Figure 14 being taken on the line L—M of Figure 13;

Figure 15 is a perspective view of a part of the ribbon showing Figures 11 and 12; and

Figure 16 is a cross section of a shaft bearing showing one use of the seatings.

In the drawings the same references are used to designate the same or similar parts.

In Figures 3 to 14 the ribbon is shown flat in order to show the manner of forming the indentations therein.

Referring to Figure 1, this shows a seating member formed of springy ribbon sheet material for example spring steel. This ribbon has a longitudinal corrugated or undulated portion 1, the corrugations or undulations of which form indentations and may be as shown in any of Figures 3 to 14 herein described.

The ribbon is curved to form a sleeve for supporting a shaft within a boring, for example, as shown in Figure 16, the ends of the ribbon being turned inwardly and abutting when disposed between the shaft and the bearing in a similar manner to that described in Specification No. 703,563. The spaced transverse indentations 2 are so formed as will be described that the curved ends 3 of the indentations extend up to said edges 4 of the ribbon so that the edges 4 are either tangential to the curved ends 3 as in Figure 1, for example, or truncate all the curved ends 3 preferably in the same degree.

Referring to Figures 3 and 4 the corrugated ribbon there shown has indentations all on the same side of the ribbon, each indentation having flat sides 5 with curved crests 6 and valleys 7 the latter being in the upper surface of the original sheet of the ribbon. It will be seen that the ends of the indentations near the edges of the ribbon are curved downwardly and are rounded, the ribbon edges being tangential thereto.

Referring to Figures 5 and 6, these show a similar indented ribbon to Figures 3 and 4 except that the edges of the ribbon truncate the curved ends of the indentations as would occur if in Figure 4 the edges of the ribbon were in the plane XX.

Figures 7 and 8 show a construction similar to Figures 3 and 4 except that the indentations have curved sides 5 and are alternatively on opposite faces of the ribbon, the ribbon edge being tangential to the curved end of each indentation.

Figures 9 and 10 show a ribbon similar to Figures 7 and 8, but with the edges of the ribbon in the plane YY of Figure 8 thereby truncating the curved indentation ends.

Figures 11 and 12 show a ribbon which has indentations, one ribbon edge being similar to that of Figure 4 and the other ribbon edge being in the opposite sense. In this construction the ribbon edge is tangential to the curved ends of the indentations.

Figures 13 and 14 show a similar ribbon formation to Figures 11 and 12 except that the edges of the ribbon lie on the plane ZZ of Figure 12.

Referring to Figure 15, this shows a section partly and in full width and partly cut away of the ribbon shown in Figures 11 and 12.

Referring to Figure 16, this shows a hub shaped machine part 8 on which a rotary shaft 9 is journalled by means of a ball-bearing comprising an outer race 10 and an inner race 11 between which the balls 12 of the bearing can rotate; the hub has the cylindrical bore 16 which serves as a seat for the outer race with the necessary tolerance between the bore and the outer race for the sleeve 1. The outer race is pressed into the bore together with the sleeve 1 as herein described. The sleeve therefor provides a springy support for the outer race in the bore and a second springy sleeve 17 may be provided as shown between the inner race and the shaft.

The dimensions d, t and h (as shown in Figures 3 and 11) of the sleeves are selected according to the desired fitting pressure.

It will be seen from the example herein described that the indentations have their ends curved down into or downwardly towards the ribbon edge and the ribbon edge is either tangential to or truncates said curved ends.

Preferably all the indentations are of the same dimensions and therefore they are truncated by the ribbon edge in the same degree, but it will be understood that the width of the indentations could be varied thereby and then the ribbon edge would truncate them in different degrees.

In the resultant bearing members the stiffness of the ribbon in its entirety and particularly in the region of the edges of the ribbon is considerably increased, and the springy seatings have all the advantages of the constructions claimed in Specification No. 703,563.

The effect of a smooth margin is retained by virtue of the fact that the curved ends of the corrugations stiffen the edges of the ribbon.

WHAT WE CLAIM IS:—

1. Improvement in or modification of the

seating means as claimed in Patent No. 703,563, characterised in that the undulations of the corrugated portion of the sleeve are spaced transverse indentations with curved ends which, at least at one edge of the ribbon, extend up to said edge which is tangential to or truncates said curved ends.

2. A seating means according to Claim 1, wherein both edges of the ribbon are tangential to or truncate the curved ends of the indentations.

3. A seating means according to Claim 1, wherein both edges of the ribbon truncate the curved indentation ends and the indentations are of the same length and width and the edges truncates all the indentations in the same degree.

4. A seating means according to Claim 1 or 2, wherein at least one ribbon edge is tangential to the centre portions of the curved ends of the indentations.

5. A seating means according to any one of Claims 1—4 wherein the end portions of the corrugations have their ends curved transversely of the general plane of the ribbon towards the edge of the ribbon and terminating in the ribbon edges.

6. A seating means according to any one of Claims 1—5 wherein the indentations are made all from one face of the ribbon.

7. A seating means according to any one of Claims 1—5 wherein the indentations are made some from the inside and some from the outside face of the ribbon preferably alternately from each face of the ribbon.

8. An improvement in or modification of the seating means for two seating members upon or within each other as claimed in Patent No. 703,563 substantially as herein described with reference to Figures 1 and 2, together with one of the constructions shown in Figures 3 and 4, Figures 5 and 6, Figures 7 and 8, Figures 9 and 10, Figures 11, 12 and 15, or Figures 13 and 14 of the drawings accompanying the provisional specification.

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27, Chancery Lane,
London, W.C.2,
Agents for the Applicants.

PROVISIONAL SPECIFICATION

Improvements in or relating to Seatings for Machine Parts

We, DEUTSCHE STAR KUGELHALTER G.m.b.H., a Body corporate, organized and existing under the laws of the Federal Republic of Germany, of Schweinfurt, Germany, do hereby declare this invention to be described in the following statement:—

This invention relates to improvements in and modifications of seating means for seating two members upon or within each other claimed in Patent No. 703,563.

Patent No. 703,563 claims a seating means for seating two members upon or within each other, comprising a ribbon of springy sheet metal curved along its longitudinal axis to form a sleeve with the ends of the ribbon juxtaposed and having smooth marginal portions extending round the sleeve and a corrugated portion between the smooth marginal portions of the opposite edges of the sleeve, the sequence of the undulations of the corrugated portion being longitudinal in relation to the ribbon.

It is a main object of the present invention to provide an improvement in or modification of the seatings aforesaid which will provide a corrugated ribbon between the two members to be seated which will facilitate assembly of the two members without substantial risk of damage by permanent distortion to the ribbon along the edges thereof when the same is fitted between the two seating members.

According to the present invention an improvement in or modification of the seating means for two seating members upon or within each other as claimed in Patent No. 703,563 is characterised in that the longitudinal series of spaced transverse indentations are so formed that at least at one edge of the ribbon curved ends of the indentations are disposed at or near the edge of the ribbon so that the edge of the ribbon is respectively tangential to the curved ends of the indentations or truncates said curved ends. In one particular construction both edges of the ribbon are tangential to or truncate the curved ends of the indentations.

In one preferred example both edges of the ribbon truncate the curved indentation ends and the indentations are preferably of the same length and width and the edges truncate all the indentations in the same degree.

In another preferred construction at least one ribbon edge is tangential to the centre portions of the curved ends of the indentations. In a further preferred construction the sides of the corrugations have their ends curved transversely of the general plane of the ribbon towards the edge of the ribbon and terminating in the ribbon edges.

The indentations may be made all from one face of the ribbon, or are made some from the inside and some from the outside face of the ribbon preferably alternatively from each face of the ribbon.

In order that the invention may be more clearly understood some constructions in accor-

dance therewith will now be described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view of a sleeve shaped ribbon according to the invention;

Figure 2 is a fragmental view of the abutting ends of a sleeve shaped ribbon;

Figure 3 is a fragmentary longitudinal elevation of a springy ribbon;

Figure 4 is a cross section on the line A—B of Figure 3, Figures 3 and 4 being drawn to a larger scale than Figures 1 and 2;

Figures 5 and 6 are similar views to Figures 3 and 4, Figure 6 being on the line C—D of Figure 5;

Figures 7 and 8 are similar views of another embodiment similar to Figures 2 and 3, Figure 8 being on the line E—F of Figure 7;

Figures 9 and 10 are similar views of a still further embodiment, Figure 10 being on the line G—H of Figure 9;

Figures 11 and 12 are similar views of a further embodiment, Figure 12 being on the line J—K of Figure 11;

Figures 13 and 14 are similar views of another construction, Figure 14 being taken on the line L—M of Figure 13;

Figure 15 is a perspective view of a part of the ribbon showing Figures 11 and 12; and

Figure 16 is a cross section of a shaft bearing showing one use of the seatings.

In the drawings the same references are used to designate the same or similar parts.

In Figures 3 to 14 the ribbon is shown flat in order to show the manner of forming the indentations therein.

Referring to Figure 1, this shows a seating member formed of springy ribbon sheet material for example spring steel. This ribbon has a longitudinal corrugated or undulated portion 1, the corrugations or undulations of which form indentations and may be as shown in any of Figures 3 to 14 herein described.

The ribbon is curved to form a sleeve for supporting a shaft within a boring, for example, as shown in Figure 16, the ends of the ribbon being turned inwardly and abutting when disposed between the shaft and the bearing in a similar manner to that described in Specification No. 703,563. The longitudinal spaced transverse indentations 2 are so formed as will be described that the curved ends 3 of the indentations are disposed near or at the edges 4 of the ribbon so that the edges 4 are either tangential to the curved ends 3 as in Figure 1, for example, or truncate all the curved ends 3 preferably in the same degree.

Referring to Figures 3 and 4 the corrugated ribbon there shown has indentations all on the same side of the ribbon, each indentation having flat sides 5 with curved crests 6 and valleys 7 the latter being in the upper surface of the original sheet of the ribbon. It will be seen that the ends 3 of the indentations near the edges of the ribbon are curved downwardly and are rounded with which the ribbon edges are tangential.

Referring to Figures 5 and 6, these show a similar indented ribbon to Figures 3 and 4 except that the edges of the ribbon truncate the curved ends of the indentations as would occur if in Figure 4 the edges of the ribbon were in the plane XX.

Figures 7 and 8 show a construction similar to Figures 3 and 4 except that the indentations have curved sides 5 and are alternatively on opposite faces of the ribbon, the ribbon edge being tangential to the curved end of each indentation.

Figures 9 and 10 show a ribbon similar to Figures 7 and 8, but with the edges of the ribbon in the plane YY of Figure 8 thereby truncating the curved indentation ends.

Figures 11 and 12 show a ribbon which has indentations, one ribbon edge being similar to that of Figure 4 and the other ribbon edge being in the opposite sense. In this construction the ribbon edge is tangential to the curved ends of the indentations.

Figures 13 and 14 show a similar ribbon formation to Figures 11 and 12 except that the edges of the ribbon lie on the plane ZZ of Figure 12.

Referring to Figure 15, this shows a section partly and in full width and partly cut away of the ribbon shown in Figures 11 and 12.

Referring to Figure 16, this shows a hub shaped machine part 8 on which a rotary shaft 9 is journalled by means of a ball-bearing comprising an outer race 10 and an inner race 11 between which the balls 12 of the bearing can rotate; the hub has the cylindrical bore 16 which serves as a seat for the outer race with the necessary tolerance between the bore and the outer race for the sleeve 1. The outer race is pressed into the bore together with the sleeve 1 as herein described. The sleeve therefore provides a springy support for the outer race in the bore and a second springy sleeve 17 may be provided as shown between the inner race and the shaft.

The dimensions d, t and h (as shown in Figures 3 and 11) of the sleeve are selected according to the desired fitting pressure.

It will be seen from the examples herein described that the indentations have their ends curved down into or downwardly towards the ribbon edge and the ribbon edge is either tangential to or truncates said curved ends.

Preferably all the indentations are of the same dimensions and therefore they are truncated by the ribbon edge in the same degree, but it will be understood that the width

of the indentations could be varied thereby and then the ribbon edge would truncate them in different degrees.

In the resultant bearing members the stiffness of the ribbon in its entirety and particularly in the region of the edges of the ribbon is considerably increased, and the springy seatings have all the advantages of the constructions claimed in Specification No. 703,563.

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